

Weekly Review 8 0910

1) Find the limits algebraically.

a) $\lim_{x \rightarrow 0} \frac{(2+x)^3 - 8}{x}$

b) $\lim_{x \rightarrow 0} \frac{x + \sin x}{x}$

c) $\lim_{x \rightarrow 0} \frac{\sin 2x}{x}$

d) $\lim_{x \rightarrow 4} \frac{2x-8}{\sqrt{x}-2}$

2) Find all the extrema of each function below algebraically. Fully justify your statements.

a) $y = xe^{\frac{1}{x}}$

b) $y = x\sqrt{8 - x^2}$

3) Find $\frac{dy}{dx}$ algebraically.

a) $y = \ln(\sec x + \tan x)$

b) $y = x \ln x - x$

c) $y = \frac{1}{2^x + 1}$

4) A 25 foot ladder is leaning against the wall of a house. The base slides away from the house at a rate of 2 ft/sec.

a) How fast is the top of the ladder sliding down the wall when the base is 7 feet from the house?

b) How fast is the angle between the ladder and the wall changing when the base is 7 feet from the house?

5) Which point(s) on the graph $y = 4 - x^2$ is(are) closest to the point (0, 2)?